Space Weather Forecast

Issued on Saturday, 27 August 2022 at 01:15 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor/Moderate radio blackouts from Moderate-class X-ray flares likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate, with the background X-ray trace well into Common-class levels. There were numerous Moderate-class flares including several in a short period of time, with the largest of the period occurring at 26/1215 UTC. Most of these flares arose from a complex region in the southeastern quadrant, which is showing a sharply-defined magnetic neutral line. There was another notable sunspot in the southwestern quadrant, which has produced several Common-class events and may have contributed to the Moderate-class flaring around 26/1315 UTC. A probable Coronal Mass Ejection (CME) from this event was seen in satellite imagery, but subsequent coronagraph imagery shows a series of westward travelling CMEs which appear to be mostly far sided. Analysis is still ongoing, but any significant Earth directed component appears unlikely at the present time.

Solar Wind / Geomagnetic Activity: The solar wind was at background levels through the period. The wind speed varied between 320-370 km/s. The Interplanetary Magnetic Field was weak, while the north-south component also varied weakly. Geomagnetic activity was Quiet throughout.

Energetic Particles / Solar Radiation: No solar radiation storms have been observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Further Moderate-class flares are likely with a slight chance of a Strong flare. A gradual decrease is likely later in the period as the southwestern complex region departs, although the southeastern complex region should remain present throughout (barring development). No new regions of note are due.

Solar Wind / Geomagnetic Activity: Earth-directed CMEs are currently considered unlikely. There are two coronal holes which will affect the current forecast. The first is a small feature which may give a minor enhancement to slightly elevated levels around 400-450 km/s. It is a positive coronal hole which may give a slightly stronger geomagnetic response at this time of year, although it is still a weak feature. This will probably be overtaken by the fast wind from the second coronal hole, which is likely to arrive during Day 2 (28 Aug), with wind speeds around 500-600 km/s, but is likely to have a more muted geomagnetic response at this time of year,. Geomagnetic activity is expected to be Quiet to Unsettled, with a chance of Active intervals with the onset of both coronal holes, and just a very slight chance of G1/Minor Storms.

Energetic Particles / Solar Radiation: There is a slight chance of solar radiation storms of S1 or greater, due to the two more complex sunspots on the disc. This risk increases very slightly for Days 2 and 3 (28-29 Aug), before declining again as one of these spots rotates away.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	40
Very Active	R3 to R5 X	No	10	10	10	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	15	15	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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